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Mathematical Attitudes and Academic Procrastination Among College Students

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Abstract— *This study aimed to determine the significant relationship between mathematical attitudes and academic procrastination among college students. This study used a quantitative approach using descriptive, correlational, and causal-comparative techniques as its research design. There was a total of 213 college students as the respondents of this study. Respondents are students of UM Tagum College coming from math-related programs. To collect the data, the researchers used adopted and modified questionnaires. For data analysis, mean, and Pearson-r were used as statistical tools. The results indicated that college student's overall level of mathematical attitude was high in terms of self-confidence, value, enjoyment, and motivation. On the other hand, the overall level of academic procrastination was moderate regarding time management, aversiveness of the task, sincerity, and personal initiative. Statistical analysis also revealed that mathematical attitudes and academic procrastination were very weakly correlated since they only attained an R-value of 0.060. The results showed a positive correlation but a non-significant relationship between mathematical attitudes and academic procrastination among college students. This research underscores the need for further investigation into the complex interplay between mathematical attitudes and academic procrastination, emphasizing potential implications for educational interventions and student support strategies.*

Keywords— *Mathematical Education: Causal Comparative: Mathematical Attitudes: Academic Procrastination: Philippines.*

I. INTRODUCTION

Academic procrastination typically happens when a task is unreasonably put off, and people become frustrated when they begin to think about it. In other words, procrastination is evident when someone continuously fails to accomplish what they ought to do to achieve specific desirable goals. The procrastinator will work on a less critical obligation rather than completing the more important one, or they may waste their time on some minor activities or pleasures instead. It may have unfavorable effects since it causes students to lose time, give up on activities, and perform their duties to a lesser extent. They are aware of the adverse impact of this delay, though, and this occurrence can make people less satisfied with their performances. Although academic procrastination occurs in many daily tasks, it is prevalent among students and is seen as harmful to academic and study progress [32][24][12].

Academic procrastination, generally viewed as a bad habit, is an important subject that has recently caught the interest of many researchers. Students often put off doing their homework until the last minute, which is one of the main reasons they do not learn and do not do well in school. In most cases, procrastinators keep themselves ready to work but avoid the activity. They frequently overlook how important schoolwork is as a need for achieving educational goals. Students rely on the internet a lot, especially in this day of rapid technological development. This attitude results from students' laziness and failure to prioritize their academic work. Millions of people are affected by procrastination, a damaging problem that frequently impairs performance, productivity, and well-being. It is universally recognized that academic procrastination is flawed and detrimental to an individual's daily routine [6][17].

Mathematical attitudes have a significant impact on academic procrastination [30][15][25]. In addition, the perspective of the Control-Value theory emphasized that if students believe that learning mathematics is unmanageable or not necessary, this will result in academic procrastination, which will have an indirect impact on mathematical achievement and keep them from improving [22]. Conversely, the theory of planned behavior states that students have stronger intentions when they have more positive mathematical attitudes during the learning process. It motivates them to complete mathematical tasks with minimal procrastination and achieve tremendous mathematical success [1].

When asked about mathematics, students claim it is challenging and complex to understand. Students tend to focus more on the difficulty of a problem than its nature or significance because it involves complex numbers and tricky calculations. Mathematical attitudes include a person's preference for or avoidance of mathematics, desire to engage in or refrain from mathematical activities, perception of their skill level, and views on mathematics's value and utility. It can be positive or negative, which may cause the person to assess the sense of control and worth of mathematics [14][20].

Many studies have provided supportive information discussing the relationship between mathematical attitudes and academic procrastination. One of the studies was the study entitled “The Association Between Mathematical Attitudes, Academic Procrastination, and Mathematical Achievement among Primary School Students: The Moderating Effect of Mathematical Cognition” [30]. In addition, previous studies have also revealed and discussed the relationship between mathematical attitude and academic procrastination [11][15][25].

Furthermore, the studies mentioned above used many variables, such as academic performance, academic

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achievement, mathematical metacognition, self-efficacy, gender, and more. However, the researchers have yet to find any studies investigating specifically the causal relationship only between mathematical attitude and academic procrastination. Moreover, in relation to this study, there needs to be more studies found in the local setting. Therefore, this study is found necessary to deeply investigate and determine whether the two variables are related, as this could increase awareness among the target beneficiaries of this study, recommend a strategy or plan to improve their mathematical attitude and prevent students from engaging in academic procrastination, particularly in mathematics subject. Thus, the urgency to conduct the study.

The study sought to determine whether mathematical attitudes are significantly related to academic procrastination. Specifically, it sought to answer the following objectives:

1. To assess the level of mathematical attitudes in terms of:
   1.1 self-confidence
   1.2 value
   1.3 enjoyment
   1.4 motivation
2. To assess the level of academic procrastination in terms of:
   2.1 time management
   2.2 aversiveness of the task
   2.3 sincerity
   2.4 personal initiative
3. To determine the significant relationship between mathematical attitudes and academic procrastination.

The hypothesis of the study was tested at a 0.05 level of significance, stating that there is no significant relationship between mathematical attitudes and academic procrastination among college students.

II. METHOD

A. Research Design

This study used a quantitative non-experimental design employing descriptive, correlational, and causal-comparative methods to collect numerical data from which statistical inferences can be drawn. This information can be used to create raw data tables and graphs. Quantitative research is a formal, systematic, and objective approach that uses numerical data to gain information for the study. Descriptive design deals with quantitative data about the said phenomenon. A descriptive research design is one that qualitatively gathers data and analyzes it quantitatively. Furthermore, the observer remains neutral and refrains from changing the observation process or affecting any of the study's variables [19][7].

Correlational research focuses on creating correlations between two or more variables within the same population and assessing their statistical relationship with minimal or no attempt to control for confounding variables [28]. A causal-comparative design is a research method for doing research that explores connections between the independent and dependent variables following a particular action or occurrence that has taken place. The researcher's objective is to compare two or more groups of people to see if the independent variable affects the outcome of the dependent variable [8].

B. Research Participants

A complete enumeration sampling technique was used in the selection of respondents who are college students at UM Tagum for the school year 2022-2023. The respondents of this study were explicitly 2nd-year college students enrolled in math-related courses such as Bachelor of Secondary Education (BSED) major in mathematics, Bachelor of Science in Electronic Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Computer Engineering, Bachelor of Science in Computer Science, and Bachelor of Science in Information Technology.

III. RESULTS AND DISCUSSIONS

A. Level of Mathematical Attitude

Table I shows the mean scores for the indicators of mathematical attitudes among college students, which revealed an overall mean of 3.65, interpreted as high with a standard deviation of 0.651. The high- level means that mathematical attitudes are much observed among college students. This further means that most respondents' responses to mathematical attitudes are positive in self-confidence, value, enjoyment, and motivation.

TABLE I. Level of Mathematical Attitude among College Students

Indicators	Mean	Standard Deviation	Descriptive Level
1. Self-confidence	3.36	0.686	Moderate
2. Value	4.11	0.607	High
3. Enjoyment	3.59	0.811	High
4. Motivation	3.52	0.866	High
Overall	**3.65**	**0.651**	**High**

The overall mean score mentioned was obtained from the result gathered from the following computed mean scores, ranging from highest to lowest: 4.11 or high for value; 3.59 or high for enjoyment; 3.52 or high for motivation; and 3.36 or moderate for self-confidence. Students who have a positive attitude toward mathematics are more likely to enjoy the subject, consider it to be an important one, and be confident in their ability to participate in mathematical activities. Students who fit this profile also spend a more significant amount of time and effort in learning mathematics [18].

Value has 4.11, the highest mean score among all the indicators, and a standard deviation of 0.607, whose goal is to give importance to mathematics among college students. This means students believe that mathematics is worthwhile and indeed a necessary subject. They see the importance of the subject in developing their minds, and it is helpful no matter what course they take. Furthermore, they believe of the fact that mathematics is helpful in many ways, thus, wanting to develop their mathematical skills more. Also, students saw the value of mathematics [31]. Similarly, despite the fact that students may perceive the subject as confusing and complicated, they still recognize the importance of learning mathematics. Moreover, students also perceived mathematics as necessary in everyday living [20].

Concerning enjoyment, it has a 3.59 mean score and a standard deviation of 0.811; it was also high among college students. The respondents display a favorable response on liking mathematics as a subject. This implies that the students

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enjoyed learning mathematics in school. Consequently, they find the subject interesting and exciting enough to be motivated to attend a mathematics class.

Students find mathematics engaging and helpful to their development, thus, making it enjoyable to attend a mathematics class [5][20]. Moreover, when students have the sense that they understand the information being taught to them in a lesson, they are more likely to experience enjoyment [21].

This is followed by motivation, which has a 3.52 mean score and a standard deviation of 0.866, which was also high among college students. The respondents exhibit a positive response to engaging in mathematical activities. This indicates that college students are confident enough to prefer to learn mathematics as their subject. This also means that students are more willing to engage in mathematical activities.

Students with a more significant amount of motivation toward mathematics are more apparent to have a positive attitude toward the subject and thus perform better in class [26]. Besides, motivation is an essential factor in students' engagement with mathematics [29]. Therefore, students should strive to sustain and foster their motivation through the establishment of personal goals and the exploration of connections between their studies and their own interests and values [3].

Finally, self-confidence, this indicator has the lowest mean score of 3.36 and a standard deviation of 0.686. It is rated as moderate, and this means the respondents believe they are averagely good in mathematics. In other words, they think they are both good and bad in mathematics. This also implies that there will be instances in which they are doubtful of themselves and somewhat worried about their mathematics class but still believe they can solve mathematics problems. In addition, students feel confident because they are willing to perform mathematical activities and believe they can learn the subject [5].

B. Level of Academic Procrastination

Table II presents the mean scores for the indicators of Academic Procrastination among College Students, which revealed an overall mean of 3.20, interpreted as moderate with a standard deviation of 0.652. The moderate level means that academic procrastination is moderately experienced among college students. This means that the respondent's response to Academic Procrastination was neutral in most of the cases in the items of Time Management, Aversiveness of the Task, Sincerity, and Personal Initiative.

TABLE II. Level of Learning Abilities of BEED Students

Indicators	Mean	Standard Deviation	Descriptive Level
1. Time Management	3.37	0.827	Moderate
2. Aversiveness of the Task	3.07	0.750	Moderate
3. Sincerity	3.14	0.774	Moderate
4. Personal Initiative	3.21	0.805	Moderate
Overall	**3.20**	**0.652**	**Moderate**

The overall mean score mentioned was obtained from the result gathered from the following computed mean scores, ranging from highest to lowest: 3.37 or moderate for Time Management; 3.21 or moderate for Personal Initiative; 3.14 or moderate for Sincerity; and 3.07 or moderate for Aversiveness of the Task. The main Academic Procrastination that was positive among college students was time management, the indicator with the highest mean score, indicating that they utilize their time effectively and efficiently. This means some students liked doing their tasks as the deadline approached. Also, students had too many other things to do, making them do tasks later as early as they should.

Furthermore, students feel relieved when they know their classmates have not started their tasks and wait for others to start doing it. Also, demonstrating poor time management may be a contributing factor to procrastination [9][27]. Additionally, the amount of work given and students' inability to manage their time correctly is a primary factor in procrastination. Furthermore, peer influence is also associated with procrastination [13].

With regard to Personal Initiative, which can be viewed in Academic Procrastination, as an indicator, it obtained the second-highest mean score. The respondents show a satisfactory response in initiating to do tasks. This indicates that college students need to be more motivated to start their tasks in a timely manner, thus, feeling too lazy to do them. One of the reasons is that they may still need clarification about the said task and need help to ask other people for information. Additionally, they may set high expectations for themselves and worry about needing help to meet those standards.

Students tend to be lazy to learn and feel exhausted, thus delaying their tasks [4]. Also, private school students demonstrate challenges in seeking assistance or clarification from their instructors [13]. Hence, there is a need for developing initiative and adaptability among college students to any teaching and learning circumstance [2].

This is followed by sincerity, which has a 3.14 mean score and a standard deviation of 0.774, which was also moderate among college students. The respondents display only moderate commitment and dedication to a given activity. This means that the respondents needed to trust themselves more to perform well in mathematics tasks. Students need more dedication to have enough energy to begin the task, which could lead to procrastination. Consequently, students would need more time to achieve their goals or finish their tasks.

One of the many reasons that students indulge in academic procrastination is because of a lack of sincerity. They lack drive and cannot focus well, which are supposedly needed to finish a task, thus having an additional effect on how efficient the outcomes are [10].

Finally, the aversiveness of the task this indicator has the lowest mean score, only 3.07, and a standard deviation of 0.750; which goal is to determine if students procrastinate if they do not like to do the tasks. In this case, the respondents showed moderate responses, which means they somewhat disliked doing the tasks because they thought the task was unpleasant enough to perform. Furthermore, they did not know what to do and felt incapable enough to do it. This also means they are worried about getting a bad grade, leading

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them to delay doing their tasks.

Likewise, students delayed their tasks because it is unpleasant and difficult to deal with, as a result, they tend to avoid the schoolwork [4]. Moreover, procrastinators start delaying the task until they cannot finish it satisfactorily to escape the consequences caused by this failure. Lastly, Academic procrastination is prevalent among students who put off a task because they do not know how to complete it or dislike it [23].

C. Significant Relationship between the Levels of Mathematical Attitudes and Academic Procrastination

TABLE III. Significance on the Relationship between Mathematical Attitudes and Academic Procrastination among College Students

Variables	R-value	P-value	Decision
Mathematical Attitudes	0.060	0.381	H_o not rejected
Academic Procrastination			

*Significant at 0.05 level of significance

The results presented in Table III highlight the significant relationship between mathematical attitudes and academic procrastination among college students.

The correlation between the overall mathematical attitudes and academic procrastination yields an r-value of 0.060 which means that the two variables are very weakly correlated. Furthermore, a positive r-value means that as the level of all domains of mathematical attitudes increases, the level of academic procrastination also increases. The computed p-value of 0.381 tells the researchers that the stated hypothesis is not rejected. This means that the two variables bear no significant correlation to one another because the computed p-value is greater than the level of significance of 0.05. This implies that Academic Procrastination is not dependent on Mathematical Attitudes.

The present study reveals that there is no significant relationship between mathematical attitudes and academic procrastination among college students at UM Tagum College. It indicates that mathematical attitude does not affect academic procrastination at all. This result implies that academic procrastination is not dependent on mathematical attitudes among college students.

Similarly, students who procrastinate do not act following their values, and as a result, they still delay a task even if it is an essential one [23]. Moreover, students' tendency to indulge in procrastination does not lessen even when there is a positive attitude about learning English. This implies that students may procrastinate even if they enjoy the subject. This coincides with the present study, in which students still procrastinate despite having a positive attitude toward mathematics [16].

IV. CONCLUSIONS

The study conducted at UM Tagum College sheds light on the relationship between mathematical attitudes and academic procrastination among college students. The findings indicate a moderate level of self-confidence and high levels of value, enjoyment, and motivation as well as the overall mean of a high level of mathematical attitudes. This suggests a generally positive outlook on mathematics among students at UM Tagum College, with a prevalent appreciation for the subject and a strong motivation to engage with it.

In contrast, the study also reveals a moderate level of academic procrastination across various dimensions such as time management, task aversiveness, sincerity, and personal initiative. This indicates a neutral stance towards procrastination among college students, highlighting the need for further exploration into the factors influencing this behavior.

Interestingly, the results unveil a positive correlation between mathematical attitudes and academic procrastination. However, this correlation was found to be non-significant, indicating that while students may possess positive attitudes towards mathematics, it does not necessarily translate into reduced procrastination tendencies.

Consequently, positive attitudes towards a subject do not inherently mitigate procrastination [16]. Also, students prone to procrastination may not consistently align their actions with their values and are inclined to postpone tasks irrespective of their significance [23].

Overall, these findings underscore the complexity of the relationship between mathematical attitudes and academic procrastination. They emphasize the importance of developing targeted interventions that address both motivational factors and procrastination tendencies to foster a conducive learning environment and promote academic success among college students.

V. RECOMMENDATIONS

The researchers suggest the following recommendations based on the findings of the study:

1. Students must develop self-discipline, self-control, and effective time management strategies to avoid procrastination and meet deadlines.
2. Students should seek support from teachers if struggling with procrastination tendencies.
3. Students should actively engage in learning activities and seek opportunities to enhance mathematical attitudes and academic performance.
4. Teachers must familiarize themselves with factors influencing academic procrastination and implement effective teaching strategies to mitigate its effects.
5. Teachers should provide guidance and support to students in managing their workload and meeting deadlines.
6. Teachers must encourage a positive learning environment that fosters motivation and engagement among students.
7. School Administrators must support initiatives aimed at addressing academic procrastination among students by providing resources and training for faculty.
8. School administrators may implement programs or workshops focused on time management skills and strategies to reduce procrastination tendencies.
9. School administrators should foster a culture of accountability and responsibility among students to promote academic success.
10. Future researchers may conduct the same study using different factors and indicators to test if it would change the research outcome. Moreover, since the study is not generalizable beyond 213 respondents, future researchers may correlate mathematical attitudes and academic procrastination

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with other groups of respondents and enhance their sample size to strengthen the study's validity.

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